

**Notice of Allowability**

Application No.

09/675,627

Examiner

Pamela E. Perkins

Applicant(s)

RUMER ET AL.

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the filing of the request for reconsideration on 14 November 2005.
2. ☒ The allowed claim(s) is/are 9-17, 26 and 28-42.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 09/23/05.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### **DETAILED ACTION**

This office action is in response to the filing of the request for reconsideration on 14 November 2005. Claims 9-17, 26, 28-42 are pending; claims 1-8, 18-25 and 27 have been cancelled.

#### ***Allowable Subject Matter***

Claims 9-17, 26 and 28-43 are allowed.

#### ***Reasons for Allowance***

The following is an examiner's statement of reasons for allowance: Applicant's arguments, see the paper filed 14 November 2005, with respect to claims 26 and 28-42 have been fully considered and are persuasive. The rejection of claims 26 and 28-30 has been withdrawn.

Referring to claims 9 and 10, prior art does not anticipate, teach, or suggest after placing the substrate in the deposition chamber introducing a quantity of hydrogen into the deposition chamber without providing power to the target.

Referring to claims 11-17, prior art does not anticipate, teach, or suggest a method of forming a titanium layer on a substrate where the substrate is placed is a sputtering chamber comprising a titanium target, flowing a first gas comprising hydrogen into the sputtering chamber through a first gas injector, terminating the flow of the first gas, after the flow of the first gas has been terminated, sputter depositing the titanium layer onto the substrate by applying power to the target and by providing a second gas

in the sputtering chamber through a second gas inject, wherein the hydrogen is activated and whereby the deposited titanium layer has a preferred crystal orientation.

Referring to claims 26 and 28-42, prior art does not anticipate, teach, or suggest placing a substrate in a physical vapor deposition chamber, the chamber comprising a titanium target; igniting a plasma in the chamber, thereby causing a titanium layer to be deposited onto the substrate by physical vapor deposition; and while the plasma is active, flowing a gas comprising hydrogen into the physical vapor deposition chamber, the titanium layer thereby having a <0002> crystal orientation.

For example, Ngan et al. (5,943,600) disclose a method of forming a titanium layer on a substrate where the substrate is placed in a deposition chamber comprising a source of titanium; and depositing a layer comprising titanium onto the substrate under conditions wherein the atmosphere in the deposition chamber comprises hydrogen, wherein after the hydrogen is released it reacts with substrate; and depositing an aluminum layer on the layer comprising titanium nitride layer.

However, Ngan et al. do not disclose, anticipate, teach, or suggest placing the substrate in the deposition chamber introducing a quantity of hydrogen into the deposition chamber without providing power to the target and the chamber comprising a titanium target; igniting a plasma in the chamber, thereby causing a titanium layer to be deposited onto the substrate; and while the plasma is active, flowing a gas comprising hydrogen into the chamber, the titanium layer thereby having a preferred crystal orientation.

Yamadai (6,083,830) discloses a method of forming a layer on a substrate where a titanium layer, with a <002> orientation, is sputter deposited on a substrate, then a titanium nitride layer, with a preferred <111> orientation, is formed on the titanium layer and an aluminum layer, with a <111> orientation, is formed on the titanium nitride layer. However, Yamadai does not disclose, anticipate, teach or suggest placing the substrate in the deposition chamber introducing a quantity of hydrogen into the deposition chamber without providing power to the target and the chamber comprising a titanium target; igniting a plasma in the chamber, thereby causing a titanium layer to be deposited onto the substrate; and while the plasma is active, flowing a gas comprising hydrogen into the chamber, the titanium layer thereby having a preferred crystal orientation.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela E. Perkins whose telephone number is (571) 272-1840. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PEP

  
ZANDRA V. SMITH  
Supervisory PRIMARY EXAMINER  
11/28/05